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ABSTRACT

A study examined whether students were able to transfer the learning of a modeled "think-aloud" strategy to comprehension monitoring in other learning situations. Sixty-four eighth grade students in a midwestern town were identified as average proficiency readers based on a cloze test. There were no significant differences among the groups (passive, active, and fullrange modeling conditions) in reading proficiency or in ability to monitor comprehension. All students were administered a questionnaire designed to answer the transfer questions of the study. Results indicated that the majority of the students used the think-aloud strategy in other classes at school. Fewer students reported using the think-aloud strategy out of school, with no significant differences among groups for transfer of the strategy to non-school situations. Results indicated significant differences among groups for use of the strategy in school, with the active and fullrange modeling groups reporting significantly more transfer situations. These students also had a greater percentage of responses than the passive group when asked "How has the think-aloud helped you?" They commented on how it helped them understand what they were reading and how it helped them deal with confusions that arose during reading. Students from all groups explained that they learned to slow down and take time to think aloud about what they were reading. Students in the active and fullrange modeling conditions were the only ones who made comments exemplifying their sense of self-efficacy. (One figure and three tables are included.) (MG)

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Thinking-Aloud: An Examination Of Its Transfer To Other Learning Situations

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Thinking-Aloud: An Examination Of Its Transfer To Other Learning Situations

Current theory and research in comprehension and reading strategies suggest that cognitive modeling (verbalizing thought processes) by teachers is an effective instructional tool that can be used to teach reading comprehension processes (Collins & Smith, 1980; Palincsar & Brown, 1984; Bereiter & Bird, 1985; Duffy, et al, 1987; Ehlinger 1988). There is, however, little documented evidence that students can transfer these strategies to other learning situations (Lysynchuk, et al., 1989).

In her evaluation of the methodological adequacy of 37 studies of reading comprehension strategy instruction, Lysynchuk and her colleagues identified a number of problems. One of these was that many studies did not assess either long-term effects or generalization of strategies to other tasks and materials. They concluded that "very few studies assessed transfer of newly learned reading comprehension strategies to school subjects or materials other than those encountered during training." There exists only a small body of studies that indicates students can transfer strategies learned in one setting to another (Palincsar and Brown, 1984; Dewitz, Carr, and Patberg, 1987).

This study is a follow-up of one that looked at how teachers model reading processes and how modeling of these processes influences the comprehension and comprehension monitoring of readers (Ehlinger, 1988). That initial study identified characteristics of effective modeling (Bandura, 1986) and applied them to cognitive modeling of reading processes using

an adaptation of Davey's (1983) "think-aloud" strategy. These characteristics were: (a) promote the functional value of the modeled task (a usefulness of the strategy being modeled that can be made relevant ot the learner), (b) instill self-efficacy in the learner (the learner's belief in his/her ability to perform a task), and (c) provide supportive feedback (encouraging statements interjected into the verbal reporting).

Ninety-seven eighth grade students, determined to be average readers who could not detect inconsistencies in passages read, were randomly assigned to the following conditions:

Passive Cognitive Modeling -- Cognitive modeling of a text passage for the student with the student then performing the strategy to him/herself outloud with another text passage.

Active Cognitive Modeling -- Modeling as above with added statement to explain the "functional value" of the modeled strategy and to foster "self-efficacy" in the student.

Fullrange Cognitive Modeling -- Modeling same as "active" group. Subject also received "supportive feedback" while performing the modeled strategy.

Control -- no modeling

Cognitive modeling was defined as "Making visible the invisible mental processes" of reading by verbalizing and performing the processes for learners (Roehler, Duffy & Meloth, 1984).

The results revealed significant differences among modeling conditions for use of reading comprehesion monitoring strategies and for reading comprehension based on oral retellings. Specifically, students in the fullrange and active modeling conditions did significantly more monitoring of their comprehension and performed significantly better on oral retellings.

With these results in mind, the question arose as to transfer. Did students use the think-aloud strategy in other classes? Did they use it in non-school settings? Were there differences in transfer among the modeling conditions? Did students understand the strategy well enough to use it unsupervised? Even though modeling the think-aloud strategy proved effective in a controlled research situation, there was still a need to ascertain if students are able to transfer the learning of the modeled strategy to comprehension monitoring in other learning situations. This evidence will help cognitive modeling become an accepted and justifiable strategy to teach reading comprehension processes. This investigation was, therefore, designed to address the following questions:

1. Do students use the modeled think-aloud strategy in other classes? Do they use it in non-school settings? How do they use it?

2. Are there differences among the modeling conditions in transfer of the think-aloud strategy to other classroom settings?

3. Are there differences among modeling conditions for students' perceptions of what they learned and what helped them from observation of the modeled strategy?

Method

Subjects

Students participating in this investigation were from a middle school in a midwest town of 50,000, and were the same eighth grade students identified in the previous study for the passive, active and fullrange modeling conditions. Students in these groups had been identified as average proficiency readers based on a cloze test. They also had difficulty monitoring their

comprehension based on a procedure used by Garner in which students are to detect inconsistencies in texts (Garner and Taylor, 1982) There were no significant differences among the groups in reading proficiency or in ability to monitor comprehension.

Materials and Procedure

Four months following the completion of the initial study, all students in the modeling conditions (active, passive, fullrange) were administered a questionnaire designed to answer the transfer questions proposed above. The questionnaire was administered in their social studies classes where students were asked by their classroom teacher to complete the questionniare and return it by the end of the class period. Students were asked, through written directions, to share some of their thoughts about the things they had worked on in the initial investigation by answering the questions. Completion of the questionnaire was voluntary and anonymous, although they were coded to facilitate analysis by treatment conditions. Eighty-four percent (N = 64) of the students returned completed questionnaires.

The questionnaire contained both closed and open form questions (see Figure 1) and followed rules of questionnaire format as noted by Borg and Gall (1983). Items were written to reflect the three research questions. Closed form questions were designed to obtain information to answer research questions 1 and 2, while open form questions were related to research question 3. The open form question, "Describe what you learned by observing the think-aloud strategy being modeled for you,"

derives from work on modeling affective behaviors conducted by Meichenbaum (1971).

Results and Discussion

Data for this investigation consists of responses on the written questionnaire. Closed form questionnaire data were analyzed with a chi-square procedure to determine frequency of transfer of the modeled think-aloud strategy to other learning situations, and for differences among conditions in usage of the think-aloud strategy in other classes and non-school situations. Students' perceptions of what they learned and what helped them learn emerged from a qualitative analysis of their open form responses to determine categories for responses. Two independent raters had 88% agreement on the categories that emerged from the analysis. The following results were noted:

Question 1

The majority of students (70%) indicated they used the think-aloud strategy in other classes at school. Most usage was noted in language arts (71.8%), social studies (51.3%), and foreign language (48.7%) (see Table 1). It is interesting to note that in areas such as technical education and health education, where textbooks were heavily used at this particular school, students reported little use of the think-aloud strategy. Why this is the case is uncertain. It is possible that it could be the result of how departments utilized the textbook in their teaching and/or what their expectations were for their students' learning from text.

Fewer students reported using the think-aloud strategy out

of school (44%), with no significant differences among groups for transfer of the strategy to non-school situations ($p < .05$). Of those who indicated use out of school, a majority (71%) used the strategy at home while reading books, newspapers, and magazines. Very few mentioned "homework" (8%). The following comments illustrate usage of the strategy at home:

> When I was reading a book and predicted what was happening in the end.... When I find something I don't get, I use it. I try to conclude the story with my own ending and see if it turns out right.
>
> I usually use it at home when I'm watching T.V. Say there was a T.V. program and it had a title appear. Right away I think of what this story is going to be about.

In discussing these results with the students' teachers, it was noted that homework assigned to students usually involved text reading. Although students seldom said they used the think-aloud strategy for "homework," they did often respond that they used it to read books at home. In actuality, they might have been using it for more school related tasks than the questionnaire data reflect.

Question 2

There were significant differences ($p < .05$) among groups for use of the strategy in school, with the "active" and "fullrange" modeling groups reporting significantly more transfer situations. Students in the active and fullrange conditions used all steps in the think-aloud strategy significantly more than did students in the passive modeling group (see Tables 2 and 3). Students in the active and fullrange modeling groups were those who were encouraged to believe in their ability to succeed at a task that had value for them. They more readily verbalized their thought

processes in the initial study and also appear to more readily use the strategy in other classroom situations.

Question 3

When asked, "How has the think-aloud strategy helped you?" a greater percentage of students in the active and fullrange modeling conditions responded than did students in the passive modeling condition (41% passive, 81% active, 67% fullrange). Specifically, these students frequently commented on how the think-aloud strategy had helped them better understand what they were reading and how it helped them clear-up confusions that arose during reading. For example:

> It helps me understand things I didn't before I used this strategy.
>
> It helped me learn more about the story - helped me to understand it better.
>
> It clears up many confusing parts of the book especially when there are many characters.
>
> It helps me if I'm stuck on something and no one is there to help me.

In addition, students in the active and fullrange modeling groups also frequently noted that the strategy helped them "get better grades" and helped them "think easier." For example:

> It has helped me to think about what I am reading.
>
> If I'm stuck on a hugh word, I think about the steps.

When asked, "Describe what you have learned by observing the think-aloud strategy being modeled for you," students in all conditions were similar in the frequency and type of responses made. They most frequently explained that they learned to slow down and take time to think about what they were reading (61% passive, 83% active, 62% fullrange). For example:

> I learned that if [you] take the story a step at a time it's not so confusing and you get more out of your reading (Passive Modeling Condition).
>
> To read slowly and think about what you're reading. That you can understand things that seem confusing if you follow the "think aloud" strategy (Active Modeling Condition).
>
> To take your time don't rush or you'll get mixed up. Stop when you don't know what a word is and try to make sense of it by using some steps (problem solving steps) (Fullrange Modeling Condition).

Although students in all modeling conditions were similar in their responses to "Describe what you learned by observing the think-aloud strategy being modeled for you," students in the active and fullrange modeling conditions were the only ones who made comments exemplifying their sense of self-efficacy. The following comments illustrate this:

> ...That I can understand things that seem confusing if I follow the "think aloud" strategy.
>
> I won't get stuck as much as I used to.
>
> I learned that it was not hard if you really put some time and effort towards it.

Conclusion

This study adds additional evidence to a small body of studies indicating that comprehension monitoring strategies can be taught to students (Palincsar & Brown, 1984; Bereiter & Bird, 1985; Duffy, et al., 1987). It is, however, only one of a few indicating that students can transfer strategies to other learning situations in a school setting (Palincsar and Brown, 1984; Dewitz, Carr, and Patberg, 1987). This is particularly important for secondary students who move from one discipline to another and one teacher to another throughout the school day. If

taught comprehension monitoring strategies in one situation, they need to perceive and internalize the strategies well enough to independently apply them in a variety of subject areas.

This study also adds further evidence to the investigation which found that when characteristics of modeling (instill self-efficacy in students, promote the functional value of the task being modeled) are included, students not only learn the modeled strategies but go beyond them to monitor themselves at a more proficient level. The results of more proficient monitoring paid off in improved comprehension for active and fullrange modeling groups. There is now initial evidence, based on the data from this investigation, that these characteristics can also influence students' ability to transfer use of modeled strategies to other learning situations, both in and out of school. Students in the active and fullrange modeling conditions, who were told the value of the task and encourage to believe in their ability to perform the modeled task, more readily used it beyond the controlled research setting.

Self-report data such as questionnaires have recognizable limitations. Students may likely be writing what they think the researcher wants to hear. They may also bias the information they offer about themselves, or may not be able to recall accurately the aspects of their behavior that the questionniare asks them to respond to. Although there are recognized limitations to self report measures, the results of this investigation appear promising and merit further attention. The ability of students to transfer learning to a variety of situations is a desirable outcome.

Figure 1

Questionnaire

Directions: I would like to find out your thoughts about some of the things you worked on with me in the beginning of the school year. To do this, I would like you to answer the following questions. To answer the questions, you will need to think back over the things we worked on and how you may have used them in other classes or at home. Try to answer all the questions as best you can. This will not affect the grade in your class.

1. Have you used the "think-aloud" strategy, that was modeled for you, in any other classes in school?

Think-aloud strategy:
Step 1 - Make a prediction
Step 2 - Make an analogy
Step 3 - Tell any confusions
Step 4 - Use fix-up strategies

_____ yes _____ no

If you answered yes to #1, check the steps you have used and how much you have used them.

Step 1 - Make a prediction	_____ a little	_____ a lot
Step 2 - Make an analogy	_____ a little	_____ a lot
Step 3 - Tell any confusions	_____ a little	_____ a lot
Step 4 - Use fix-up strategies	_____ a little	_____ a lot

If you answered yes to #1, what classes have you use it it?

_____ language arts	_____ math
_____ social studies	_____ tech ed.
_____ health ed.	_____ a music class
_____ P.E	_____ science
_____ an art class	_____ any other classes
_____ a foreign language	

2. Have you used the "think-aloud" strategy on your own when you were not in school?

_____ yes _____ no

If you answered yes for #2, explain <u>where</u> you used the "think-aloud" strategy.

If you answered yes for #2, explain <u>how</u> you used the "think-aloud" strategy.

3. How has the "think-aloud" strategy helped you?

4. Describe what you learned by observing the "think-aloud" strategy being modeled for you.

Table 1

Percentage of Use of Think-Aloud Strategy in Classes

Class	Percentage
Language Arts	71.8
Social Studies	51.3
Foreign Language	48.7
Science	33.3
Mathematics	23.1
Health	15.4
Music	12.8
Others	7.7
Art	5.1
Technical Education	2.6
Physical Education	2.6

Table 2

Chi-Square Analysis For Use of Steps in the Think-Aloud Strategy in School

Steps	Chi-square	D.F.	P
Step 1 Make a Prediction	6.855	2	.0325
Step 2 Share an Analogy	5.877	2	.0530
Step 3 Verbalize Confusions	7.760	2	.0206
Step 4 Use Fix-ups	6.971	2	.0306

Table 3

Chi-Square Analysis For Use of Think-Aloud Strategy Steps by Pairs of Treatment Conditions

Steps	Pairs of Groups		
	Passive Active	Passive Fullrange	Active Fullrange
Step 1 Prediction	5.467*	4.624*	.054
Step 2 Analogy	4.111*	4.624*	.011
Step 3 Confusions	5.512*	6.109*	.011
Step 4 Fix-ups	4.111*	6.019*	.187

* denotes significant difference between pairs at $p < .05$

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